PERIOD CHANGE OF δ Sct STAR HD 79889

HD 79889 was first reported as a variable star by Oja (1986). Some astronomers calculated its period: $0\overset{d}{.}0958697$ (Oja, 1987), $0\overset{d}{.}095869448$ (Rodriguez et al., 1990), $0\overset{d}{.}095869483$ (Wunder et al., 1992). Liu et al. (1991) studied its period variation and obtained a negative rate of period change $(-2.1\times10^{-11}$ $dc^{-2})$. However Tang et al. (1992) observed this star and obtained a positive rate of period change $(1.1\times10^{-11}$ $dc^{-2})$.

In order to study its period change we observed this star with the 60 cm telescope at Xinglong Station of Beijing Astronomical Observatory from 30 January to 12 February 1993 and from 16 February to 4 March 1994. The Johnson V filter was used. HD 80079 was used as comparison. 16 times of maximum light obtained by us are listed in Table 1, where T_{max} is the time of maximum light in HJD, E is cycle number, W is weight. The light curves for two nights are plotted in Figure 1.

Table 1. Times of maximum light of HD 79889 (1993-1994)

No.	T_{max}	E	W
1	2449018.0768	−2.0	1.0
2	2449018.1726	−1.0	1.0
3	2449018.2685	0.0	1.0
4	2449018.3644	1.0	1.0
5	2449019.0352	8.0	1.0
6	2449021.0500	29.0	1.0
7	2449022.0079	39.0	1.0
8	2449030.0605	123.0	1.0
9	2449031.0192	133.0	1.0
10	2449400.0215	3982.0	1.0
11	2449400.1173	3983.0	1.0
12	2449401.0753	3993.0	1.0
13	2449401.1713	3994.0	1.0
14	2449413.0593	4118.0	1.0
15	2449413.1553	4119.0	1.0
16	2449416.1272	4150.0	1.0

Besides our 16 times of maximum light we collected all data of HD 79889 obtained by other astronomers (Oja, 1987; Rodriguez et al., 1990; Liu et al., 1991; Wunder et al., 1992; Tang et al., 1992). We acquired altogether 60 times of maximum light. On the base of 60 times of maximum light we calculated the improved elements of HD 79889 by the method of least squares:

$$T_{max}=HJD2449018.2684+0\overset{d}{.}09586954\times E \qquad (1)$$
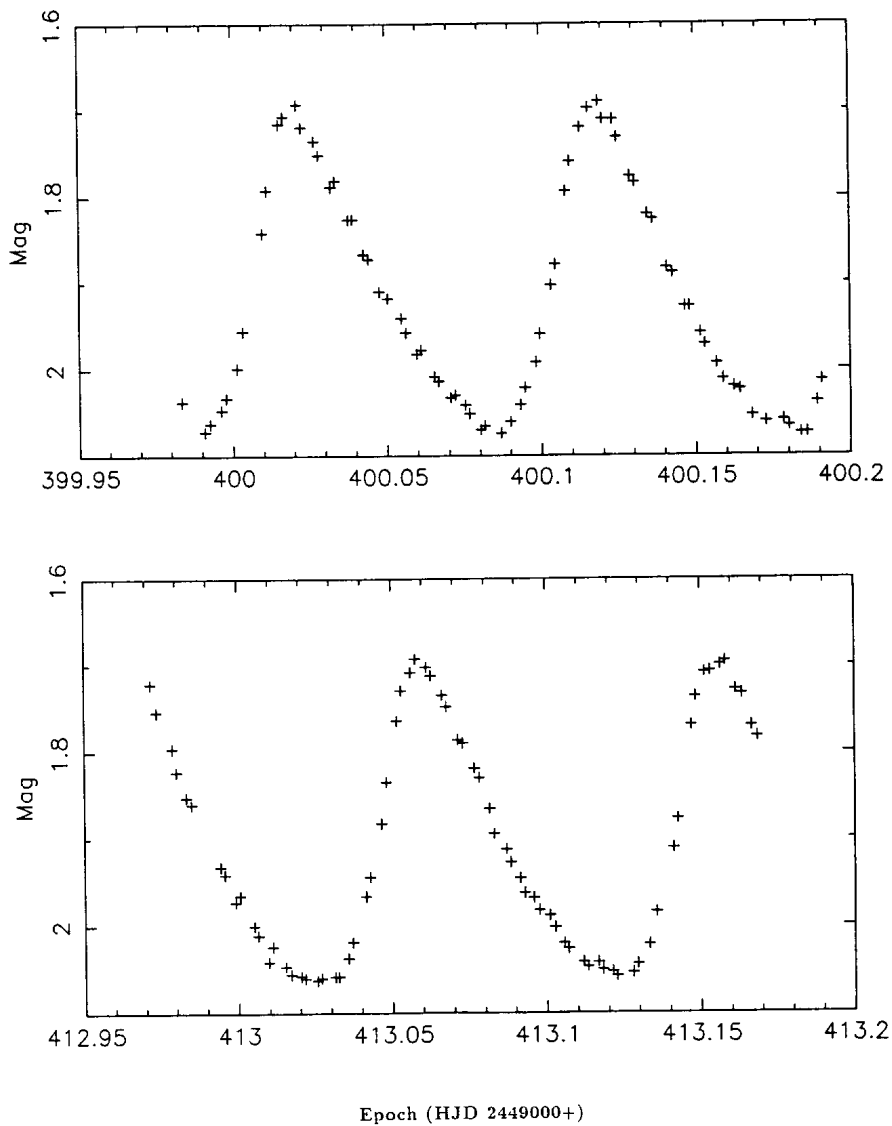
Epoch (HJD 2449000+)

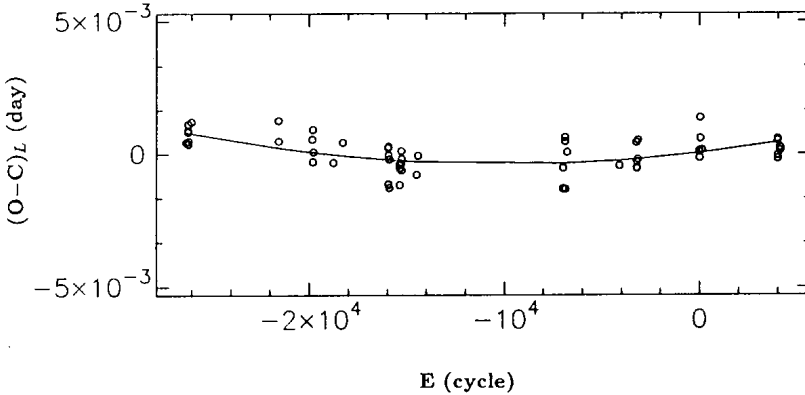Figure 1. Light curve relative to comparison star.

Figure 2. The $(O-C)_L$ diagram of HD 79889 and its fit curve.

In order to study the variations of period we used the above formula and calculated all times of maximum light. Then the residuals between observations and calculations $(O-C)_L$ were obtained. The $(O-C)_L$ were fitted with a parabola as shown in Figure 2. The parabola means variation of the period. So we obtained the equation by the method of least squares:

$$T_{max} = HJD 2449018.2684 + 0\overset{d}{.}09586963 \times E + 0.5 \times G \times E^2 \tag{2}$$

G is the rate of period change. Its value is $8.8 \times 10^{-12} (dc^{-2})$. Since the rate of period change is positive, it means that the pulsation period is increasing. This result agrees with that obtained by Tang et al. (1992).

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